Curriculum Long Term Planning Overview	Key Stage 3	Subject Area: Maths	

Year	Study Modules	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2

Year 7 Set 1	**Study Modules**	**Number 1 and Calculating**
		
		• Recall prime numbers up to 100
		• Understand the meaning of prime factor
		• Write a number as a product of its prime factors
		• Use a Venn diagram to sort information
		• Use prime factorisations to find the highest common factor of two numbers
		• Use prime factorisations to find the lowest common multiple of two numbers
		• Solve worded questions involving hcf and lcm
		• Know how to identify any significant figure in any number
		• Approximate by rounding to any significant figure in any number
		• Add or subtract from a negative number
		• Add (or subtract) a negative number to (from) a positive number
		• Add (or subtract) a negative number to (from) a negative number
			Algebraic Manipulation 1
			
			• Know the meaning of expression, term, formula, equation, function
			• Know basic algebraic notation (the rules of algebra)
			• Use letters to represent variables
			• Identify like terms in an expression
			• Simplify an expression by collecting like terms
			• Know how to multiply a (positive) single term over a bracket (the distributive law)
			• Substitute positive numbers into expressions and formulae
			• Given a function, establish outputs from given inputs
			• Given a function, establish inputs from given outputs
			• Use a mapping diagram (function machine) to represent a function
			• Use an expression to represent a function
			   Use the order of operations correctly in algebraic situations
				Exploring FDP and Calculating with FDP
				
				• Identify if a fraction is terminating or recurring
				• Recall some decimal and fraction equivalents (e.g. tenths, fifths, eighths)
				• Write a decimal as a fraction
				• Find equivalent fractions and write a fraction in its lowest terms by cancelling common factors
				• Identify when a fraction can be scaled to tenths or hundredths
				• Convert between FDP
				• Convert between mixed numbers and improper fractions
				   Apply all four operations to fractions and mixed numbers.
				• Recognise when a fraction (percentage) should be interpreted as a number
				• Recognise when a fraction (percentage) should be interpreted as an operator
				• Identify the multiplier for a percentage increase or decrease when the percentage is greater than 100%
				• Use calculators to increase an amount by
					Proportional Reasoning
					
					• Identify ratio in a real-life context
					• Write a ratio to describe a situation
					• Find equivalent ratios and understand how to simplify a ratio
					• Divide an amount by a given ratio
					• Understand the connections between ratios and fractions
					• Understand the meaning of a compound unit
					• Convert between compound units
					• Know the connection between speed, distance and time
					• Solve problems involving speed
					   Identify when it is necessary to convert quantities in order to use a sensible unit of measure
					
					Sequences 1
					
					• Use a term-to-term rule to generate a linear sequence
					• Use a term-to-term rule to generate a non-linear sequence
					• Find the term-to-term rule for a sequence
					• Describe a number sequence
						Algebraic Manipulation 2, Formulae and Solving Equations 1
						
						• Know how to write products algebraically
						• Use fractions when working in algebraic situations
						• Simplify an expression involving terms with combinations of variables (e.g. $3a^2b + 4ab^2 + 2a^2 - a^2b$)
						• Identify common factors (numerical and algebraic) of terms in an expression
						• Factorise an expression by taking out common factors
						• Simplify an expression involving terms with combinations of variables (e.g. $3a^2b + 4ab^2 + 2a^2 - a^2b$)
						• Know the multiplication, division, power and zero law of indices
						• Know the negative and fractions law of indices.
						• Understand that negative powers can arise
						• Substitute positive and negative numbers into formulae
						• Be aware of common scientific formulae
							Investigating angles
							
							• Identify alternate angles and know that they are equal
							• Identify corresponding angles and know that they are equal
							• Use knowledge of alternate and corresponding angles to calculate missing angles in geometrical diagrams
							• Establish the fact that angles in a triangle must total 180° (apply to algebraic problems)
							• Solve missing angle problems involving alternate angles
							• Solve missing angle problems involving corresponding angles
							• Use the fact that angles in a triangle total 180° to work out the total of the angles in any polygon
							• Establish the size of an interior angle in a regular polygon
							• Know the total of the exterior angles in any polygon
							• Establish the size of an exterior angle in a regular polygon
							   Solve missing angle problems in polygons

		• Multiply positive numbers by a negative number
		• Multiply negative numbers by a negative number
		• Divide positive numbers by a negative number
		• Divide negative numbers by a negative number
		• Know how to square (or cube) a negative number
		• Enter negative numbers into a calculator
		• Use a scientific calculator to calculate with fractions, both positive and negative
		• Interpret a calculator display when working with negative numbers
		• Understand how to use the order of operations including powers
		• Understand how to use the order of operations including roots
				a percentage greater than 100%
				• Solve problems involving percentage change
				• Solve original value problems when working with percentages
				• Solve financial problems including simple interest
				• Understand the meaning of giving an exact solution
				   Solve problems that require exact calculation with fractions
					• Solve problems involving the term-to-term rule for a sequence
					   Solve problems involving the term-to-term rule for a non-numerical sequence
						• Know the meaning of the 'subject' of a formula
						• Change the subject of a formula when one step is required
						   Change the subject of a formula when a two steps are required
						• Building equations
						• Choose the required inverse operation when solving an equation
						• Identify the correct order of undoing the operations in an equation
						• Solve one-step equations when the solution is a whole number (fraction)
						• Solve two-step equations (including the use of brackets) when the solution is a whole number
						• Solve two-step equations (including the use of brackets) when the solution is a fraction
						• Solve three-step equations (including the use of brackets) when the solution is a whole number
						• Solve three-step equations (including the use of brackets) when the solution is a fraction
						• Check the solution to an equation by substitution
							Constructions 1
							
							• Use compasses to construct clean arcs
							• Use ruler and compasses to construct an equilateral triangle
							• Use ruler and compasses to construct an isosceles triangle
							• Use ruler and compasses to construct a right angled triangle
							• Know how to deal with a change in depth when dealing with plans and elevations
							• Construct a shape from its plans and elevations
							   Construct the plan and elevations of a given shape

| | | | | | | **Investigating angles**

- Identify alternate angles and know that they are equal
- Identify corresponding angles and know that they are equal
- Use knowledge of alternate and corresponding angles to calculate missing angles in geometrical diagrams
- Establish the fact that angles in a triangle must total 180° (apply to algebraic problems)
- Solve missing angle problems involving alternate angles
- Solve missing angle problems involving corresponding angles
- Use the fact that angles in a triangle total 180° to work out the total of the angles in any polygon
- Establish the size of an interior angle in a regular polygon
- Know the total of the exterior angles in any polygon
- Establish the size of an exterior angle in a regular polygon
Solve missing angle problems in polygons | |
| | **Assessment** | Open book end of topic assessment | Closed book end of term test | Open book end of topic assessment | Open book end of topic assessment | Open book end of topic assessment | Closed book end of term test |

Year	Study Modules	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Year 8	Study	Calculating Space	Straight Line	Algebraic	Presentation of	Triangles	Measuring Data

Set 1	Modules		Graphs	Manipulation 3	Data		

Column 1 (under Modules):

- Calculate the area of a trapezium
- Know the vocabulary of circles
- Know that the number π (pi) = 3.1415926535…
- Recall π to two decimal places
- Know the formula circumference of a circle = $2\pi r = \pi d$
- Calculate the circumference of a circle when radius (diameter) is given
- Calculate the radius (diameter) of a circle when the circumference is known
- Calculate the perimeter of composite shapes that include sections of a circle
- Know the formula area of a circle = πr^2
- Calculate the area of a circle when radius (diameter) is given
- Calculate the radius (diameter) of a circle when the area is known
- Calculate the area of composite shapes that include sections of a circle
- Know the formula for finding the volume of a right prism (cylinder)
- Calculate the volume of a right prism

Calculate the volume of a cylinder

Straight Line Graphs

Graphs

- Know that graphs of functions of the form y = mx + c, x ± y = c and ax ± by = c are linear
- Plot graphs of functions of the form y = mx + c (x ± y = c, ax ± by = c)
- Plot graphs of functions of the form ax ± by = c
- Draw and recognise the graphs of y = c and x = c
- Understand the concept of the gradient of a straight line
- Find the gradient of a straight line on a unit grid
- Find the y-intercept of a straight line
- Sketch a linear graph
- Distinguish between a linear and quadratic graph
- Plot graphs of quadratic functions of the form y = x² ± c
- Sketch a simple quadratic graph
- Plot and interpret graphs of piece-wise linear functions in real contexts
- Plot and interpret distance-time graphs (speed-time graphs)
- Find approximate solutions to kinematic problems involving distance and speed

Solving Equations 2

Manipulation 3

- Understand the meaning of an identity
- Multiply two linear expressions of the form (x + a)(x + b)
- Multiply two linear expressions of the form (x ± a)(x ± b)
- Expand the expression (x ± a)²
- Simplify an expression involving 'x²' by collecting like terms
- Identify when it is necessary to remove factors to factorise a quadratic expression
- Identify when it is necessary to find two linear expressions to factorise a quadratic expression
- Factorise a quadratic expression of the form x² + bx + c

Data

- Construct and interpret pie charts
- Construct graphs of time series
- Interpret graphs of time series
- Construct and interpret compound bar charts
- Interpret a wider range of non-standard graphs and charts
- Understand that correlation does not indicate causation
- Interpret a scatter diagram using understanding of correlation
- Construct a line of best fit on a scatter diagram
- Use a line of best fit to estimate values
- Know when it is appropriate to use a line of best fit to estimate values

Number 2

- Calculate with positive indices (roots) using written methods
- Calculate with negative indices in the context of standard form
- Use a calculator to evaluate numerical expressions involving powers (roots)
- Interpret a number written in standard form
- Add (subtract) numbers written in standard form
- Multiply (divide) numbers written in standard form

- Know Pythagoras' theorem
- Identify the hypotenuse in a right-angled triangle
- Know when to apply Pythagoras' theorem
- Calculate the hypotenuse of a right-angled triangle using Pythagoras' theorem

Calculate one of the shorter sides in a right-angled triangle using Pythagoras' theorem

Sequences 2

- Understand the meaning of a position-to-term rule
- Use a position-to-term rule to generate a sequence
- Find the position-to-term rule for a given sequence
- Use algebra to describe the position-to-term rule of a linear sequence (the nth term)

Use the nth term of a sequence to deduce if a given number is in a sequence

Constructions 2

- Use ruler and compasses to construct the perpendicular bisector of a line segment
- Use ruler and compasses to bisect an angle

- Find the modal class of set of grouped data
- Find the class containing the median of a set of data
- Calculate an estimate of the mean from a grouped frequency table
- Estimate the range from a grouped frequency table
- Analyse and compare sets of data, appreciating the limitations of different statistics (mean, median, mode, range)

Choose appropriate statistics to describe a set of data

Probability

- Know that probability is a way of measuring likeliness
- Know and use the vocabulary of probability
- Understand the use of the 0-1 scale to measure probability
- Assess likeliness and place events on a probability scale
- List all the outcomes for an experiment
- Identify equally likely outcomes
- Work out theoretical probabilities for events with equally likely outcomes
- Know how to represent a probability
- Recognise when it is not possible to work out a theoretical

		- Know that graphs of functions of the form y = mx + c, x ± y = c and ax ± by = c are linear - Plot graphs of functions of the form y = mx + c (x ± y = c, ax ± by = c) - Plot graphs of functions of the form ax ± by = c - Draw and recognise the graphs of y = c and x = c - Understand the concept of the gradient of a straight line - Find the gradient of a straight line on a unit grid - Find the y-intercept of a straight line - Sketch a linear graph - Distinguish between a linear and quadratic graph - Plot graphs of quadratic functions of the form y = x² ± c - Sketch a simple quadratic graph - Plot and interpret graphs of piece-wise linear functions in real contexts - Plot and interpret distance-time graphs (speed-time graphs) - Find approximate solutions to kinematic problems involving distance and speed	- Solve linear equations with the unknown on both sides when the solution is a whole number - Solve linear equations with the unknown on both sides when the solution is a fraction - Solve linear equations with the unknown on both sides when the solution is a negative number - Solve linear equations with the unknown on both sides when the equation involves brackets - Recognise that the point of intersection of two graphs corresponds to the solution of a connected equation Check the solution to an equation by substitution **Transformations** - Translate a shape given a vector - Reflect shapes in the x and y axis - Rotate a shape about a point, given an angle and direction - Use the centre and scale factor to carry out an enlargement of a 2D shape with a fractional scale factor - Find the scale factor of an enlargement with fractional scale factor - Find the centre of an enlargement with fractional scale factor - Perform a sequence of transformations on a 2D shape		- Convert a 'near miss' into standard form; e.g. 23 × 10⁷ - Enter a calculation written in standard form into a scientific calculator - Interpret the standard form display of a scientific calculator - Understand the difference between truncating and rounding - Identify the minimum and maximum values of an amount that has been rounded (to nearest x, x d.p., x s.f.) - Use inequalities to describe the range of values for a rounded value Solve problems involving the maximum and minimum values of an amount that has been rounded	- Use a ruler and compasses to construct a perpendicular to a line from a point (at a point) - Understand the meaning of locus (loci) - Know how to construct the locus of points a fixed distance from a point (from a line) - Identify when to use the locus of points a fixed distance from a point (from a line) - Identify when a perpendicular bisector is needed to solve a loci problem Identify when an angle bisector is needed to solve a loci problem	probability for an event - Know that the sum of probabilities for all outcomes is 1 Apply the fact that the sum of probabilities for all outcomes is 1 - List all elements in a combination of sets using a Venn diagram - List outcomes of an event systematically - Use a table to list all outcomes of an event - List outcomes of an event using a grid (two-way table) - Calculate probabilities using a possibility space - Use theoretical probability to calculate expected outcomes Use experimental probability to calculate expected outcomes

			• Find and describe a single transformation given two congruent 2D shapes Solve problems involving similarity				
	Assessment	Open book end of topic assessment	Closed book end of term test	Open book end of topic assessment	Open book end of topic assessment	Open book end of topic assessment	Closed book end of term test